REMARKS:

Status Of Claims

Claims 1-4, 6-10, 12-21, 23-33, 35-41, and 43-46 were previously pending. Claim 37 has been amended. Claims 21-28 and 41 have been canceled. Thus, claims 1-4, 6-10, 12-20, 29-33, 35-40, and 43-46 are currently pending in the application with claims 1, 8, 14, 29, 37, and 44 being independent.

Office Action

Applicant would like to thank the Examiner for indicating that claims 16-19 would be allowable if rewritten in independent form.

In the Office Action, the Examiner rejected claims 1, 2, 4, 6-9, 12-15, 20, 29-32, 35-36, and 44-46 under 35 U.S.C. § 103(a) as being unpatentable over Fruchterman et al., U.S. Patent No. 5,470,233, in view of Tognazzini, U.S. Patent No. 5,872,526. The Examiner also rejected claims 3, 10, and 33 under 35 U.S.C. 103(a) as being unpatentable over Fruchterman and Tognazzini in view of Colley, U.S. Patent No. 5,592,382. The Examiner also rejected claims 37-40 and 43 under 35 U.S.C. 103(a) as being unpatentable over Fruchterman and Tognazzini in view of Heron, U.S. Patent No. 6,055,478. The Examiner also rejected claim 41 under 35 U.S.C. 103(a) as being unpatentable over Fruchterman and Tognazzini in view of Heron and Colley. Applicant respectfully submits that the currently pending claims distinguish the present invention over Fruchterman, Tognazzini, Colley, Anderson, Heron, and the other prior art references taken alone or in

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combination.

Specifically, claims 1, 8, and 14 each recite "analyzing cartographic data for a predetermined area around the present location for user identified criteria to avoid, wherein a shape of the predetermined area is based on a heading". Similarly, claim 29 recites "analyzing cartographic data for a predetermined area around the present location for user identified criteria to avoid, wherein a size of the predetermined area is based on a speed". Finally, claim 44 recites "analyzes cartographic data for a predetermined area around the present location value for user identified criteria to avoid, wherein a size and shape of the predetermined area is based on a speed and heading".

In contrast, neither Fruchterman nor Tognazzini discloses a size or shape of the predetermined area being based on a speed or heading. The Examiner admits that "Fruchterman does not teach a predetermined area around a user with a predetermined shaped based on heading". Page 2 of the Office Action. Thus, the Examiner cites Tognazzini and mistakently asserts that Tognazzini "calculates a predetermined area based on heading (column 7-8)". Pages 2-3 of the Office Action. However, merely calculating an area, at least as done by Tognazzini, is not within the scope of the claims. Rather, the claims explicitly recite "wherein a shape of the predetermined area is based on a heading", "wherein a size of the predetermined area is based on a speed", or "wherein a size and shape of the predetermined area is based on a speed and heading". Thus, the claims require calculation of specific aspects of 'the area' based on specified criteria, which is simply not shown by the cited prior art.

For example, columns 7 and 8 of Tognazzini merely teach "a threat sphere" or a "threat cylinder ... the axis of which extends in the Z (elevational) direction". Column 8, lines 9-18. Furthermore, as disclosed in column 8, lines 9-19, the threat sphere and threat cylinder are simply centered on a current location and are defined by the formulas $X^2 + Y^2 + Z^2 = R^2$ and $X^2 + Y^2 = R^2$ (for all values of Z), respectively. A sphere or vertical cylinder, by their very nature, and as defined by these formula, must be completely independent of heading. Thus, Tognazzini teaches a threat boundary completely independent of heading.

Tognazzini does teach calculating a velocity vector in column 7. However, Tognazzini does not base his threat sphere or threat cylinder on any speed or heading. Rather, Tognazzini teaches "[i]f a projection of the velocity vector, for example, of aircraft 500b intersects the threat sphere of aircraft 500a or the threat cylinder of aircraft 500d, a potential collision is detected and one level of warning would be appropriate". Colum 8, lines 21-25. In other words, Tognazzini merely teaches providing a warning when the velocity vector intersects his threat sphere or threat cylinder, which by their very nature as a sphere or vertical cylinder must be completely independent of heading.

On page 12 of the Office Action, the Examiner asserts that "the threat sphere must move and change according to the direction of the aircraft, and it is inherent then that the area is based upon heading and speed". Applicant acknowledges that Tognazzini teaches locating his threat sphere or threat cylinder about a moving aircraft, and therefore the location of his threat sphere or threat cylinder has some relationship to heading and speed over time. However, Tognazzini does not teach basing even the location of his threat

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sphere or threat cylinder directly on heading or speed. This would be projecting the threat sphere or threat cylinder beyond the aircraft's current location and onto some expected future location. Such anticipation is simply not done with Tognazzini's threat sphere or threat cylinder. Such anticipation is only done with Tognazzini's velocity vector, which is separate and distinct with respect to his threat sphere or threat cylinder. Rather, Tognazzini bases the location of his threat sphere or threat cylinder purely on the location of the aircraft, of which heading and speed are merely time derivatives. So, at best, there is some indirect relationship, between the location of his threat sphere or threat cylinder and heading and/or speed.

In any case, the claims are not directed to calculating **the location** of the predetermined area based on heading and/or speed. Rather, the claims are directed to basing **a size and/or shape** of the predetermined area on a speed and/or heading. Simply put, as discussed above, at no point does Tognazzini calculate his threat sphere or threat cylinder based on the velocity vector. Instead, Tognazzini looks for, and warns about, intersections between his velocity vector and his threat sphere or threat cylinder. Thus, Tognazzini simply fails to teach the claim limitations.

With regard to speed, as claimed in claim 29 and 44, the Examiner also admits that "Fruchterman does not teach a predetermined area around a user with a predetermined shaped based on speed". Page 5 of the Office Action. Thus, the Examiner cites Tognazzini and mistakently asserts that Tognazzini "calculates a predetermined area based on velocity vector (column 7-8)". *Id.* As discussed above, at no point does

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Tognazzini calculate his threat sphere or threat cylinder based on the velocity vector. Instead, Tognazzini looks for, and warns about, intersections between his velocity vector and his threat sphere or threat cylinder. Thus, Tognazzini simply fails to teach the claim limitations.

Furthermore, there is no motivation to modify either Fruchterman or Tognazzini to base a size or shape of the predetermined area on a speed or heading. For example, as Fruchterman discloses in column 17, lines 38-41, "[a] user defines an area of exclusion by inputting coordinates that correspond to the corners of a polygon defining its perimeter, or coordinates corresponding to a center point of a circle, and a desired radius". Fruchterman's area of exclusion is compared with his linear course. Therefore, Fruchterman's only predetermined area, his area of exclusion, has a size and shape defined by the user. Modifying an area of exclusion based on speed or heading would render Fruchterman's "user define[d] area of exclusion" unsatisfactory for its intended purpose. Thus, Fruchterman explicitly teaches away from basing a size or shape of the predetermined area on a speed or heading, and there can be no suggestion or motivation to modify Fruchterman.

Finally, Tognazinni is simply not analyzing cartographic data. Rather, Tognazinni analyzes positional data of other aircraft, as received from the other aircraft. Analyzing cartographic data would render Tognazinni unsatisfactory for its intended purpose, as cartographic data would not typically be of use in avoiding midair collisions between aircraft, which is Tognazinni's explicit purpose. As a result, no combination of Fruchterman

and/or Tognazzini discloses, suggests, or makes obvious the limitations of claims 1, 8, 14, 29, or 44. Furthermore, neither Fruchterman nor Tognazinni can be modified to render the claimed limitations obvious, as there is, and indeed can be, no suggestion or motivation to make such a modification.

Claims 3 and 33 each recite "wherein calculating the course includes identifying one or more non-user selected waypoints on the course". Similarly, claim 10 recites "wherein the course calculated by the route calculation algorithm further includes identifying one or more non-user selected waypoints on the course". Finally, claim 37 now recites "wherein the processor operates on the route calculation algorithm to identify one or more non-user selected waypoints between the two or more waypoints".

In contrast, the Examiner acknowledges that neither Fruchterman nor Tognazzini teach these claim limitations. Page 7 of the Office Action. Thus, the Examiner cites Colley and mistakently asserts that Colley's "intermediate segments are not user defined". *Id.* In supporting this assertion, the Examiner points to column 2, lines 14-20, which state "[s]everal segments waypoints define an optimum route to reach the destination waypoint. Accordingly, the desired destination is represented by a destination waypoint". However, Colley actually fails to specify how the waypoints are selected. Thus, one can only assume that Colley's waypoints are selected in the conventional manner by the user.

Clearly, the user would at least select the desired destination and thereby the destination waypoint. Colley goes on to describe how each waypoint, in turn, is treated as

a destination waypoint. As a result, Colley appears to teach, if anything, the user selecting each and every waypoint.

Furthermore, Colley is completely devoid of any suggestion of identifying any non-user selected waypoint as part of a route calculation, much less to avoid user identified criteria. As a result, no combination of Fruchterman, Tognazzini and/or Colley discloses, suggests, or makes obvious the limitations of claims 3, 10, 33, or 37.

The remaining claims all depend directly or indirectly from independent claims 1, 8, 14, 29, 37, or 44, and are therefore also allowable.

Any additional fee which is due in connection with this amendment should be applied against our Deposit Account No. 501-791. In view of the foregoing, a Notice of Allowance appears to be in order and such is courteously solicited.

Respectfully submitted,

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